

E.) REMARKS

This Response is filed in response to the Office Action dated January 6, 2006.

Upon entry of this Response, claims 1-53 will be pending in the Application.

In the outstanding Office Action, the Examiner withdrew from consideration claims 2-42; rejected claims 1, 43, 44, 52 and 53 under 35 U.S.C. § 103(a) as being unpatentable over Holden (U.S. Patent No. 6,659,726 B2); and objected to claims 45-51.

Rejection under 35 U.S.C. 103

The Examiner rejected claims 1, 43, 44, 52 and 53 under 35 U.S.C. § 103(a) as being unpatentable over Holden (U.S. Patent No. 6,659,726 B2), hereafter referred to as "Holden."

Specifically, the Examiner stated that

Claims 1, 43, 44, 52, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holden.

As per claim 1, Holden teaches a method of controlling a multi-compressor refrigeration system comprising variable speed drive 12, a plurality of variable speed motors 16 powering a plurality of compressors 17, monitoring an operating condition (load requirement), and determining whether to increase or decrease the output capacity of the system and adjusting the configuration of the motors to control the output capacity (see steps 1-4 in Figure 2). Holden does not specifically teach the variable-speed motors being inverters. However, the use of inverters-type motors to control compressors is old and well-known in the art. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use inverter-type motors in the system of Holden for the purpose of taking advantage of the well-known variable speed capabilities that such inverters provide.

As per claim 43, Holden further teaches adding or subtracting motors and controlling the operating frequency of the motors (steps 1-4 of Figure 2).

As per claim 44, Holden teaches starting a predetermined number (one) of the motors in response to determined load requirements (step 1 of Figure 2).

As per claim 52, Holden teaches monitoring whether a motor is enabled and operating at minimum speed (step 3 of Figure 2).

As per claim 53, Holden teaches monitoring whether a motor is enabled and not operating at minimum speed and decreasing the motor speed according to load requirements (step 4 of Figure 2).

Applicants respectfully traverse the rejection of claims 1, 43, 44, 52 and 53 under 35 U.S.C. § 103(a).

Holden, as understood, is directed to a system for variable speed control of a plurality of motors under a variable load demand. The system includes a constant power source and a plurality of motors having electrical circuits with switches to connect with the constant power source. The system further includes a variable speed drive for driving one of the plurality of motors at a variable speed, wherein each of the plurality of motors includes a switch to connect with the variable speed drive. The plurality of motors is selectively electrically connected with the variable speed drive and the constant power source via the switches, for driving the plurality of motors at one of variable and constant speed in response to load demands. The electric circuit used to connect the VSD and the motors functions to place only one motor on the VSD at a time. When the load exceeds the capacity of a single operating motor that is powered by the VSD, that motor is taken off the VSD and is operated at full load or fixed speed in the circuit based on line power, and another motor is started on VSD power to provide the additional capacity.

In contrast, independent claim 1 recites a method for controlling the capacity of a multiple compressor chiller system, the method comprising the steps of: providing a variable speed drive having a plurality of inverters, wherein each inverter is configured to power a corresponding compressor motor of a multiple compressor chiller system; monitoring at least one operating condition of a multiple compressor chiller system; determining whether to increase output capacity of a multiple compressor chiller system in response to the at least one monitored

operating condition; adjusting an operating configuration of the plurality of inverters to increase the output capacity of a multiple compressor chiller system in response to a determination to increase output capacity; determining whether to decrease output capacity of a multiple compressor chiller system in response to the at least one monitored operating condition; and adjusting an operating configuration of the plurality of inverters to decrease the output capacity of a multiple compressor chiller system in response to a determination to decrease output capacity.

Independent claim 43 recites a capacity control method for a multiple compressor chiller system, the method comprising the steps of: providing a variable speed drive having a plurality of inverters, wherein each inverter is configured to power a corresponding compressor motor of a multiple compressor chiller system at a preselected output frequency; monitoring at least one operating condition of a multiple compressor chiller system; determining whether to increase capacity in the multiple compressor chiller system in response to the at least one monitored operating condition; configuring the plurality of inverters to generate increased capacity in the multiple compressor chiller system in response to a determination to increase capacity, wherein the step of configuring the plurality of inverters to generate increased capacity includes: determining whether to enable an additional inverter of the plurality of inverters in order to start an additional compressor motor of the multiple compressor chiller system; enabling an additional inverter of the plurality of inverters in response to a determination to enable an additional inverter; and adjusting the preselected output frequency of each operating inverter of the plurality of inverters; determining whether to decrease capacity in the multiple compressor chiller system in response to the at least one monitored operating condition; and configuring the plurality of inverters to generate decreased capacity in the multiple compressor chiller system in response to a determination to decrease capacity, wherein the step of configuring the plurality of inverters to generate decreased capacity includes: determining whether to disable an operating inverter of the plurality of inverters in order to stop a compressor motor of the multiple compressor chiller system; disabling an operating inverter of the plurality of inverters in response to a determination to disable an operating inverter; and decreasing the preselected output frequency of each operating inverter of the plurality of inverters.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

See Manual of Patent Examining Procedure, 8th Edition, Revision 4, (MPEP) § 2143.03.

Several of the features recited by Applicant in independent claims 1 and 43 are not taught or suggested by Holden. First, Holden does not teach or suggest a variable speed drive having a plurality of inverters. The system in Holden teaches the use of a single variable speed having a single inverter to power a single motor at a variable speed. There is nothing in Holden that remotely teaches or suggests that the variable speed drive in Holden would include more than one inverter.

The Examiner states "Holden does not specifically teach the variable speed motors being inverters" and that the "use of inverters-type motors to control compressors is old and well-known in the art." Applicant does not understand the Examiner's reference to "inverters-type motors" as one skilled in the art understands that the inverter and the motor are separate components. Applicant can only presume that the Examiner is attempting to modify Holden to use multiple inverters with the motors in Holden. However, this attempted modification of Holden by the Examiner is clearly improper.

First, Holden teaches away from the use of multiple inverters as recited by Applicant. In the Background of the Invention, Holden teaches away from such an interpretation by stating "[v]ariable speed drives are expensive and therefore, multiple compressor systems requiring multiple variable speed drives also become extensively more expensive. In addition, the need for multiple variable speed drives adds to the complexity and size of the air conditioning or refrigeration system." See Holden, column 1, lines 25-30. It would seem clear that Holden's aversion to the use of multiple variable speed drives clearly translates to an aversion to use multiple inverters as recited by Applicant in claims 1 and 43. The examiner is reminded that a "prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721

F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984)." See MPEP § 2141.03.

Next, the Examiner's proposed modification of Holden would render Holden unsatisfactory for its intended purpose and would change the principle of operation of Holden. The Examiner is reminded that "[i]f the proposed modification or combination of the prior art would change the principle or operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." See MPEP § 2143.01. Furthermore, "[i]f [the] proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)." See MPEP § 2143.01. The system in Holden operates on the basic premise that one motor is operated at variable speeds and that the remaining motors are operated at a fixed speed on line power. The Examiner's attempt to introduce additional inverters into the operation of Holden would render the control system of Holden inoperable as the control system would not know how to control two or more inverters because the basic control system is designed to operate only one variable speed drive. In addition, the system in Holden is designed to have only one of the motors operating on the variable speed drive in order to satisfy capacity demands that fall between the capacities provided by the motors operating at full capacity. By introducing multiple inverters into Holden, the system in Holden would not be satisfactory for its intended purpose because the variable speed drive would no longer be "filling in" gaps in capacity, but would actually be used in satisfying particular capacity requirements without the requirement to operate motors at full capacity.

Applicant submits that dependent claims 44, 52 and 53 are distinguishable from Holden for at least the following reasons. To begin, dependent claims 44, 52 and 53 are believed to be distinguishable from Holden as depending from what is believed to be an allowable independent claim 43 as discussed above. In addition, claims 44, 52 and 53 recite further limitations that distinguish over the applied art. Therefore, in view of the above, dependent claims 44, 52 and 53 are believed to be distinguishable from Holden and therefore are not anticipated nor rendered obvious by Holden.

In addition, since independent claim 1 is believed to be allowable for the reasons discussed above, Applicant requests that the Examiner rejoin claims 2-31 which are dependent from claim 1.

In conclusion, it is respectfully submitted that claims 1 and 43-53 are not anticipated nor rendered obvious by Holden and are therefore allowable and it is respectfully submitted that claims 2-31 should be rejoined in the Application as depending from what is believed to be an allowable claim 1.

Allowable Subject Matter

The Examiner objected to claims 45-51 as being dependent upon a rejected base claim, but indicated that the claims would be allowable, if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant appreciates the Examiner's indication of allowable subject matter, but believes that all of the claims are allowable for the reasons given above.

CONCLUSION

In view of the above, Applicant respectfully requests reconsideration of the Application and withdrawal of the outstanding objections and rejections. As a result of the remarks presented herein, Applicant respectfully submits that claims 1 and 43-53 are not anticipated by nor rendered obvious by Holden and thus, are in condition for allowance. In addition, claims 2-31 should be rejoined in the Application by the Examiner as depending from what is believed to be an allowable claim 1. As the claims are not anticipated by nor rendered obvious in view of the applied art, Applicant requests allowance of claims 1-31 and 43-53 in a timely manner. If the Examiner believes that prosecution of this Application could be expedited by a telephone conference, the Examiner is encouraged to contact the Applicant.

The Commissioner is hereby authorized to charge any additional fees and credit any overpayments to Deposit Account No. 50-1059.

Respectfully submitted,
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